A Comparative Analysis of Infant Health in the US:

According to the World Health Organization (WHO), maternal and infant health is one of the greatest indicators of the health of a nation (2012). In terms of key indicators for maternal and infant health, specifically infant mortality, the United States lags behind comparable nations with significantly worse birth outcomes (WHO, 2011). The infant mortality rate in the U.S. is about 6 per 1,000 live births, more than double the rate of infant mortality in Sweden, Finland, Norway, Japan, South Korea, and Singapore (CIA, 2017), despite the fact that the U.S. spends a greater proportion of its GDP on healthcare than other comparable nations (Sawyer and Cox, 2018). The greatest contributing factor to a higher infant mortality in the United States is the high rate of preterm births (CDC, 2009). In fact, research identified that preterm births replaced infectious disease in 2014 as the most common killer of children under five years old (Lawn and Kinney, 2014).

According to the Center for Disease Control, approximately 1 in 10 babies born in the U.S. are born prematurely (CDC, 2019). The rate of preterm births increased from 2014 to 2016 overall for the U.S., including significant increased in 23 states and the District of Columbia (Martin and Osterman, 2018). The U.S. ranks among the top ten countries in the world for the number of preterm births, contributing to approximately 2.6% of all preterm births worldwide (Chawanpaiboon et al, 2014). While a global survey of preterm birth rates has not been conducted by the World Health Organization since 2010, the thorough examination of preterm births worldwide placed the United States preterm birth rate at a comparable point to that of Turkey, Somalia, and Lesotho. The preterm birth rate in the U.S. far exceeded that of many economically comparable nations including Sweden, Finland, Denmark, Norway, Japan, the United Kingdom and France, even to the point of being almost double the rates present in these comparable countries (WHO, 2011). Within the U.S., large regional discrepancies between preterm birth rates exist. Preterm birth rates are worst in Louisiana, Mississippi, Alabama, and West Virginia. Within these regions, large racial disparities exist. For example, in Louisiana a black woman is 51% more likely to have a preterm baby than all other women. In Minnesota, though preterm birth rates overall are much lower, racial disparities are still clearly evident as American Indian/Alaskan Native (AIAN) women are 58% more likely to have a preterm baby (National Center for Health Statistics, 2017).

To identify public health and policy interventions to improve maternal and infant health, our research focuses on why preterm birth rates are high in the United States. In order to arrive at potential solutions to the high preterm birth rates in the U.S., we analyzed and discussed contributing factors such as maternal age, income, social support, insurance status, pre-existing health, environment, education, and drug use.

From the factors we analyzed, there were several things that stood out. First, the connection between maternal age and preterm birth rates was not entirely clear, as comparable nations have as many or more older mothers, yet also fewer preterm births (Fuchs et al., 2018).

We concluded that this may be since fertility treatments are common in older mothers in the U.S. and elsewhere, the treatments are perhaps more effective and less likely to result in multiple births in other comparable nations like Denmark than in the U.S. (Mohr and Koch, 2016). We also considered that even though teen birth rates are falling in the U.S. there are still more teen mothers than in comparable nations, pulling the average age of mothers down and potentially causing more birth complications (Sedgh, 2015).

With socioeconomic factors, we found a mother's income that matters for her child's well-being, but also paternal/family involvement and income, the reliability and stability of a mother's workplace, and the ability for the mother have time off with her baby without losing her job or the means to care for herself and her child (Brumberg and Shah, 2015). Looking at health from a broad perspective, one can see that finances are a large determinant of human physiological well-being and the likelihood of a person to have chronic disease. Even though there seems to be a causal relationship between poverty and illness, there are also many factors that compound to make poverty problematic for a person's well-being. These factors include stress, what one is exposed to in their neighborhood, lack of access to quality healthcare, and lack of access to high quality education. What is especially problematic in the U.S. is the large gap in wealth accumulation and financial security between people of different racial backgrounds, potentially contributing to the large gap in birth outcomes (Williams, 2017).

Social support was also evidently critical, but in a multifaceted way. Interpersonal social support from family, friends, and acquaintances was crucial to the success of a woman's pregnancy. Women who were unmarried, had lower levels of education, had unintended pregnancies, or more children tended to have lower scores for interpersonal social support and worse birth outcomes (Nkansah-Amankra, 2010). On a macro-level, the general societal support for women's issues tends to correlate with birth outcomes. In the U.S. women do not have guaranteed paid time off, which disproportionately negatively affects single mothers who on average also have lower levels of social support. In addition, once women go back to work, they do not receive the same promotional opportunities as their male counterparts, leading to large pay gaps over time between women and men, once again affecting the stress level of single mothers specifically (Burtle and Bezruchka, 2016).

Lack of financial and social stability relates to heightened stress among mothers. Percieved stress, including stress related to the effects of discrimination over time, have been shown to increase preterm birth risk (Nansel et al., 2006). Discriminatory stress is not isolated to overt incidents, but rather is cumulative, impacting a woman's physiology and her likelihood to seek out preterm care as women of color are less likely to trust healthcare professionals (Halbert et al, 2006). Women also are more likely to have a high stress pregnancy if the pregnancy is unintended, which is more common in the United States than in comparable nations (Jansen et al, 2009).

Birth outcomes also relate to a woman's environment during pregnancy. If a woman is exposed to heavy air pollution, this increases her risk of preterm birth. Environmental factors are

largely dependent on socioeconomic status, as lower income areas tend to have greater exposure to toxins (Lin et al., 2016). Similarly, low income areas tend to have higher crime rates and less access to healthy foods, leading to more stress and reduced health for mothers. Even if wealthier people are in food deserts, they typically have access to transportation that allows them to access supermarkets and buy healthier foods (Nash et al, 2013).

The pre-existing health of mothers includes nutrition, rather a host of factors within pre-existing health have been linked to preterm births. Inflammatory bowel disease is related to preterm births (Brohms et al., 2016). Infections such as bacterial vaginosis and periodontitis, a type of gum disease, are linked to preterm births largely because they may be associated with pre-eclampsia (Kunnen et al., 2006). Bacterial vaginosis specifically is largely stratified in prevalence based on race, which is important to recognize when analyzing racial discrepancies in outcomes (Usher-Pines, 2009). Chronic hypertension and gestational diabetes are linked to preterm births (Madan et al, 2009). It is notable that the United States rates of diabetes and obesity are very high while compared to comparable nations, though obesity rates are tending to rise globally due to changes in lifestyle and food production (Sutton et al., 2010).

Another negative way the United States stands out among comparable nations is the extremely high rate of sexually transmitted infections (STIs) (Thompson, 2018). STIs are an independent contributing factor to preterm births (Mann et al., 2010). Chlamydia is an especially prominent STI within the U.S. and presents few symptoms. Substantial racial disparities in those affected with chlamydia exist, with prevalence among non-Hispanic blacks 5.6 times the prevalence in non-Hispanic whites (CDC, 2017). Though STI screenings are a routine part of prenatal care within the first trimester, if a woman does not utilize preterm care within the first trimester of pregnancy it may still affect her risk for preterm birth (ACOG, 2017). Moreover, African American women are least likely to utilize preterm care right away and women in general are less likely to seek treatment for an STI than men, a challenging combination of likelihoods that lead to increased risks (Fortenberry, 2011). STIs are a serious issue as one study with a random sample attributed 14% of preterm births to chlamydia alone (Rohrs et al, 2011).

The high rate of preterm births in the U.S. is not only baffling due to the high cost of healthcare in the United States, but it also presents a cyclical problem. Having a child that is born prematurely leads to higher costs of healthcare during birth and infancy, costs are raised to approximately $55,000 per birth for premature babies compared to $4,500 for other births (Minnesota Department of Health, 2019). Yet, a disproportionate amount of premature births are occurring for women with low socioeconomic security and/or who are on Medicaid or little to no insurance coverage (Whitehead, 2012). Thus, these high costs are mainly distributed to government spending and the pockets of families that are already struggling financially. Still, premature births can lead to future health complications for the child born too early, including chronic conditions which require high healthcare expenditures and also disproportionately affect people of lower socioeconomic status who rely on Medicaid (Luu et al., 2016).

Previous policy strategies have focused mainly on prenatal care as a means of preventative health care aimed to help birth outcomes and align pregnancy and infant health statistics to the rates of comparable countries. While it is of the utmost importance to have a well functioning system of prenatal care, there is more to consider while attempting to reduce preterm birth rates in the United States than merely prenatal and postpartum care. The rampant problem of preterm births cannot be written off as a natural phenomenon due to the rising age of mothers or increased use of fertility treatments as these factors are comparable or less extreme than in comparable countries with lower preterm birth rates, rather it must be acknowledged that the health discrepancies among communities in the United States are not isolated to the nine months of pregnancy. The health of mothers must be addressed earlier, and women in general, whether they are planning to bear children in the near future or not must have the ability to achieve health. For if women are healthy, physically and mentally and financially, there will be a higher likelihood of healthy births.

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